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LeeAnna Fabin
leeanna.fabin@go.mnstate.edu

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The Investigation of the Effectiveness of the Application *Super Why* in Preschool Literacy Skills

A Project Presented to
the Graduate Faculty of
Minnesota State University Moorhead

By
LeeAnna Fabin

In Partial Fulfillment of the
Requirements of the Degree of
Masters of Science in
Curriculum and Instruction

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Abstract

The purpose of this study was to investigate the effectiveness of the application *Super Why* in preschool literacy skills. Adequate early childhood literacy skills are highly important for children entering Kindergarten to help ensure they are skilled in reading and writing. As many students still lack in literacy skills upon entering Kindergarten, this study was conducted to see if the use of tablets could help boost letter identification and letter sound skills in young learners. 14 preschool students participated in the study, all receiving normal literacy instruction. 7 of the students received an additional intervention of using the app *Super Why* on an iPad for 15 minutes per day for 4 weeks. The conclusion of the study gave some slightly positive effects on preschool literacy skills after using the app *Super Why* to help boost letter recognition and letter sound identification skills.

Chapter One

Introduction

General Problem/Issue

Early literacy skills can help set the stage for future success in schools for many children. Wolf (2016) explains that early reading skills involve teaching children print to sound decoding processes, which involves the letters and each sound the letter represents. Many early childhood teachers use a variety of curricula and lessons to teach these skills. Piasta (2016) describes that despite expanding attention to literacy experiences and perspectives in early childhood, many students still begin kindergarten with less than optimal early literacy skills. Educators need to provide a variety of opportunities for young children to develop early literacy skills for future success in the classroom, as the curriculum might not always cut it. Wolf (2016) supports this point by explaining that, “Unless early decoding skills move beyond mastery to become an automatic subconscious habit, reading is likely to remain poor.” (p. 11). It is essential for students to master these skills early on in order to continue reaching success in literacy skills.

As an early childhood teacher, I follow our curriculum in order to teach the many skills children need going into kindergarten, including early literacy skills. Each year, I find many of my students struggling to grasp phonological awareness, or letter-sound relationships. There are many interventions out there that could have potential benefits for these early childhood literacy skills, including the use of technology. With so much technology out there it can be difficult to pinpoint which technological interventions are appropriate and effective for early childhood students. It is highly important to find technology that is the right fit for my students that is also engaging and can promote student achievement. Our school has access to Epson boards, computers, and now new iPads for teachers to check out. With the use of our new school iPads, I

can now implement new technology into the classroom to help children master letter recognition and letter sound skills.

The purpose of this study is to see what effects educational literacy applications (apps) can have on preschool literacy skills, specifically letter recognition and letter sound identification. My goal as an early childhood educator is to find an app that students can use in the classroom to enhance what I am teaching them. The app will be used as a supplement to what we are already doing and could potentially have positive effects. It is important for children to be able to learn in a variety of ways, and I want to see if there are positive effects and gains in their phonological awareness skills using technological methods in addition to the curriculum lessons. My students in past years have struggled in this area, so I find it important to find new ways to help promote literacy skills for my preschoolers. Research has shown that technology can have positive effects on student learning, so this could be a new way to reach my students.

Statement of hypothesis. It is hypothesized that students who use literacy apps, such as *Super Why*, may have positive effects in their literacy skills of letter recognition and letter sound awareness.

Subjects and Setting

Description of subjects. The participants who will be in this study will consist of 14 of my 21 preschool aged students. The students range in age from four to five years old. There are seven female students, and eleven male students. One student identifies as Asian-American, four students identify as black or African-American, two as Latino, and the remaining eleven identify as Caucasian. Four of the 18 students are on Individualized Education Plans (IEP) for special education services. All students are members of my general education classroom at our early learning school. Half of the students will receive the additional intervention of using a literacy

app to see if there are positive effects on letter and letter sound skills, while the other half will remain using the curriculum lessons that I will provide for all students.

I am the general education teacher who will administer the iPads and apps that the students will be using during the study.

Our full-time para-professional will also participate by helping keep track of data through observation data sheets for each student.

Selection criteria. These students are in my classroom who participate in half day preschool and are in the process of learning literacy skills such as letter recognition and letter sound identification. Their skills vary in how many letters and letter sounds they know, and I am choosing a group of students that show a variety in learning levels in this area.

Description of setting. This setting takes place in a public preschool in a midsize town in the Midwest. The district is made up of about 17,449 students and 1,163 teachers. There are approximately 1,900 students who are English Language Learners (ELL), and approximately 2,850 students on Individual Education Plans (IEPs). Students in our building attend half day sessions (morning or afternoon) for two hours and thirty minutes per day. There will be seven students in the control group in the morning session and seven students in the afternoon session who will be using the intervention.

Research Ethics

I will obtain permission to conduct this research study from the Institutional Review Board at Minnesota State University- Moorhead and the school district. Permission will be received from the building principal at the school where the research was conducted. Permission will be received from subjects and their parents as the subjects are minors.

Definitions.

For the purpose of this study the following terms are defined.

App: “An application, typically a small, specialized program downloaded onto mobile devices.”

(Dictionary.com, n.d.)

Super Why: “The popular PBS Kids’ TV show *Super Why!* comes to life in this educational app designed to get early learners practicing basic reading and spelling skills”

(Learningworksforkids.com, 2020).

Phonological Awareness: “Phonological awareness is a broad skill that includes identifying and manipulating units of oral language- parts such as words, syllables, and onsets and rimes.”

(readingrockets.org, n.d.)

Chapter Two

Review of Literature

Introduction

Literacy in early education can help prepare students entering kindergarten with knowledge in areas such as letter recognition, phonological awareness, phonemic awareness, rhyming, and more. Technology also offers many tools today to engage k-12 students in literacy as well as other subject areas. When merging these two concepts together, early childhood teachers can create a technology rich environment that also helps students work on mastering literacy skills. Burne et al (2011) explains that, “Preschoolers with adequate pre-literacy knowledge turn into better readers and writers than preschoolers whose knowledge is inadequate.” (p. 208). It is important for educators to provide and implement rich opportunities for students to grow in their literacy skills in a world where technology is booming. Shamir et al. (2018) argues that with the shift in technology in our world, children should develop traditional literacy skills in order to communicate, while also cultural and social skills in order to carry on with digital media in this technological age. With the use of technology, such as computers, tablets, and educational apps, early childhood students are now able to work on many literacy skills before entering kindergarten.

Technology in Education

Today’s world is filled with technology; people can gather information, learn new topics, play games, watch videos, all within one touch of a screen. Our schools are no different. As technology grows in our world, it will continue to grow in the classroom as well. Putman (2017) describes how the term “technology” can be very broad when it comes to viewing technology in education. She goes on to say that it can mean a variety of things, from software to hardware,

from a process to a product. With this in mind, she further explains that the research on technology in education can be broad, making it difficult to draw conclusions or find generalizations about the role and effectiveness of technology in schools. With technology continuing to grow and expand within so many branches, more research is needed to determine what technology should look like in the classroom and how effective it is in student learning. Research by Northrup and Killeen (2013) explains that while technology can play a role in increasing student motivation and engagement, it does not automatically lead to higher student achievement. Educators must keep this in mind when choosing types of technology to use in their classrooms and their effectiveness of them.

The use of technology in schools has skyrocketed within the last five years. Hutchinson et al. (2012) explains that iPads and tablets promote anytime, anywhere learning in classrooms where children do not need to be sitting in front of a desktop computer or in a computer lab anymore. Tablets also offer endless types of apps that can enhance previously unseen potential for mobile learning. Research by Neumann and Neumann (2014) supports these ideas by explaining that tablets are light, portable, handheld devices with a touch screen that students can use anywhere. These features allow for all ages and grade levels to use technology in classrooms, even for young students in early childhood settings. These handheld devices are one of the new approaches to integrating technology in the classroom.

Some even argue that technology can have harmful effects in education, especially in early childhood. David Elkind (2016) explains that young children still need to explore and understand the real world before they can immerse themselves in the virtual world. He points out that apps for early childhood education use do not provide any sort of freedom for creative play, which is an important component of education in the early years. Lentz et al (2014) also agree

that there can be disadvantages to technology in education. They explain risks such as computer addiction, internet safety, and health risks such as obesity due to too much screen time. They can agree that technology should be monitored and limited in order to help prevent some of these risks factors while children are still young. These are all risks that teachers, and even parents, should be aware of before introducing technology into a young child's life.

Technology for the disadvantaged. It is important for educators to help all children develop skills in technology. Although many families at home have devices such as smart phones, tablets, and computers, there are families who do not have access to this technology in their homes. Shamir et al. (2018) describes that children who have had access to technologies in their homes their whole lives are more likely to develop analytical, creative, and social skills, therefore, it is important for curricula to provide equal opportunities despite children's backgrounds. In schools and across different backgrounds, technology could be a solution to low literacy rates. Shamir et al. (2018) continues by stating that research has shown how important it is for educators to pinpoint students who are in need of an intervention as soon as possible in order to help all children with academic success. With this in mind, technology could potentially help at risk children who are in need of more at school.

Technology could also be a benefit for those students who have a disability. Burne et al. (2011) states that despite the Individuals with Disabilities Education Act (2004), which helps ensure all children have the right and access to equal education, students with disabilities can still fall short of their peers, and may still need extra support. It is further explained that, "Kids with disabilities tend to acquire literacy skills at a rate slower than their peers, so assistive technology can help play a role." (Burne, et al., 2011, p. 207). Although there is much research that could still be done around assistive technology, they explain that there is still evidence supporting the

successful implementation of assistive technology in helping literacy skills in early childhood students.

Early childhood technology with literacy. Young children who can acquire early literacy knowledge in preschool will be that much more prepared when they enter kindergarten. Neumann and Neumann (2014) explain that early literacy skills, such as letter naming and sound skills, print and writing concepts, and phonological awareness skills are important precursors of later reading and writing skills. It is important for educators to provide opportunities for students to be successful in these areas to promote even further success.

Implementing Technology

Choosing appropriate literacy apps. In research by Kervin (2016), she uses Vygotsky's concepts when explaining how technology can play a role in early childhood literacy education. She explains that Vygotsky emphasizes young children learning through play, and in today's world, the same can hold true for digital play. Now while there are endless fun and engaging apps out there for young children to practice literacy skills, it is important to pick research based apps that are appropriate for the children and their learning processes. There can be a lot of false marketing for products and apps that claim to be research based or tied to a curriculum that they do not actually have (Guernsey & Levine, 2015). Educators and parents must be wary before downloading the first fun and exciting app they find. Northrup and Killeen (2013) also use Vygotsky's concepts to explain that in order to have effective results, the technology should be situated in the student's zone of proximal development. The zone of proximal development is defined as, "The distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." (Vygotsky, 1978, p. 86).

Northrup and Killeen (2013) go on to explain further that regardless of children's capabilities when using technology, it does not necessarily mean the child understands the literacy content included in the app, therefore, it should be a good fit for their learning level. Neumann and Neumann (2014) support this idea in that while children may enjoy using apps and playing educational games, they may experience a level of frustration or boredom if the app is not appropriately challenging or at the correct level of difficulty. Educators must carefully pick apps that match the student's learning level, while also keeping in mind the goals of the curriculum and appropriateness of the technology itself.

Neumann and Neumann (2014) created a list of features that parents and educators should follow when choosing and using literacy apps for their young child. They suggest the app must: be age appropriate and linked to a curriculum, be interactive and provide stimulation, build on prior knowledge, encourage problem solving, creativity, as well as critical thinking skills, give a clear purpose of tasks, provide feedback, and guide the performance, as opposed to finishing with a success or failure. They explain that there are many apps out there claiming to be educational for children, but lack in many or all of these features. The research from Neumann and Nuemann (2014) found only a few apps that could have positive effects on literacy skills. *Super Why* and *Martha Speaks: Dog Party* were two apps studied with young children that did show positive effects on vocabulary and phonological awareness skills.

The What Works Clearinghouse (WWC) also offers a wide variety of interventions for teachers to use in their classrooms. These interventions provide evidence and research backing them up in order to meet high standards of proving to be effective. *Daisy Quest* was another app found to have positive effects on alphabetic skills (What Works Clearinghouse).

Implementation approaches.

Guernsey and Levine (2015) suggest a “third way” approach to implementing technology which shows that the apps, devices, and software are seen as tools to promote better and more intercommunications between students and adults. They describe it as thinking about how you can fit technology into young students’ lives; to understand that it will take a combination of parents, teachers, and high-quality media to really support students’ learning; and to heighten literacy and enable children. (Guernsey & Levine, 2015).

Research by Northrup and Killeen (2013) suggest following an instructional framework when implementing technology into the classroom. This explains that the teacher should model how to use the app, and is then followed by guided practice. Once the student is comfortable they can work independently. This approach transfers the instruction from teacher to student. The teacher will be able to guide, scaffold, and provide feedback for students along the way. Northrup and Killeen (2013) go on to further explain that in order to provide skill development and learning opportunities for these early literacy skills, teachers should use a gradual release of responsibility method. This ensures children can master the skills at their level in an appropriate time frame; allowing their control too soon or not soon enough could result in lack of engagement, achievement, or missed concepts.

Conclusion

Children learn in a variety of ways, and many can argue that they learn from active exploration. Neumann (2016) describes, “From a Piagetian perspective, children learn to construct knowledge through their active explorations of reading and writing” (p. 62). Young children using technology to play and interact with can potentially show benefits for their literacy skills. Although much research still needs to be done in this area, it is important for educators to understand what types and uses of technology are out there, and what is appropriate

for each student and their learning levels. There are many approaches to using technology in the classroom, but it is up to educators to find and implement new and exciting ways for early childhood students to learn literacy skills.

Chapter Three

Data Collection

Research Questions

Over the last few years I have noticed my students struggle to gain literacy skills when it comes to recognizing upper and lowercase letters and letter sound identification. I want to find a new and creative way to help them gain literacy skills in the preschool setting. I have created these research questions with the goal of boosting my preschooler's literacy skills using technology:

- 1) What impact does the educational app *Super Why* have on preschool literacy skills?

Research Methods

Research plan. All students will receive regular literacy instruction through the curriculum in the morning and afternoon preschool classes. The afternoon students will receive the literacy intervention of using the app *Super Why* on the iPad for at least one hour per school week. This could amount to at least 15 minutes per school day of using the app as a supplement in addition to regular classroom instruction. I will match morning students with afternoon students who have similar scores for letter and letter sound identification.

I will gradually phase the afternoon students into using the app *Super Why* through a process that includes: modeling, guiding, and then transferring the responsibility to the student so they can work independently on the app, while monitoring students along the way. Students will then independently work on the app *Super Why* for approximately 15 minutes per day during the school week. The intervention phase will last for six weeks. Before the intervention phase, I will complete a pre-test using our School Readiness observation form (Figure 2.) Throughout the time, I will be completing observations and data collection on all morning and afternoon students

regarding their literacy skills in letter recognition and letter sound identification using the teacher observation letter record sheet. At the completion of the intervention phase, I will complete a post School Readiness form on all students.

Data collection. Data will be collected using qualitative and quantitative features. I will use pre-and post-tests, ongoing data collection forms, and qualitative parent interview data. I will use our School Readiness data form (Figure 2.), teacher observation letter record (Figure 1.), an iPad use collection sheet (Figure 3.).

I will conduct an initial baseline pretest using our School Readiness form that includes all upper and lowercase letters and letter sounds. This will help me see what students already know, and what they still need to work on. I will fill out the School Readiness form at the completion of the study for a final assessment on which letters and sounds students have mastered.

Teacher observations will be conducted with myself and our full-time para professional. We will take note on the teacher observation letter record sheet when we notice a student has mastered a specific letter recognition or letter sound throughout our lessons and play time. Students will master a letter or sound when they can identify the letter or sound at least five times independently. The data collection sheet includes each student, each upper and lowercase letter, and a sound box per letter that will indicate if they have mastered the letter sound(s). We will circle the letters as students are able to name them, and write a 1 or 2 in the sound box as they master the number of letter sound(s) for that particular letter. This data collection process will help keep track of student data over time, while also taking note of their successes during play and other parts of the day.

I will monitor the use of the iPads and the app *Super Why* on a data collection sheet to keep track of how long the students are using the app, and for how many days. Seven students in the morning preschool session will be receiving instruction through the curriculum but without the use of *Super Why*. Seven students in the afternoon preschool session will receive instruction through the curriculum but will also use the app *Super Why* for at about one hour per week, or at least 15 minutes per day for six weeks. I will initial each day the child uses the app as clarification that I was monitoring the students, and they were using the app with fidelity throughout the use of it.

The data I collect will give insight on what skills students already know. The School Readiness observation form will allow me to see which letters and sounds students have already mastered, and can allow me to adjust my regular classroom instruction accordingly. Our teacher observation letter record sheet will allow myself, as well as our para-professional, to complete observations throughout the entire day, not just during literacy instruction to analyze the skills in various settings and parts of the day. This will help analyze if the skills the students are learning during instruction time is transferring over into other parts of their school day, such as play time.

Ethical issues. There is little to no risk in this study because all children will still be receiving regular literacy instruction during the school day. There are possible benefits for the intervention group as there may be positive effects on student literacy skills when using the application *Super Why*.

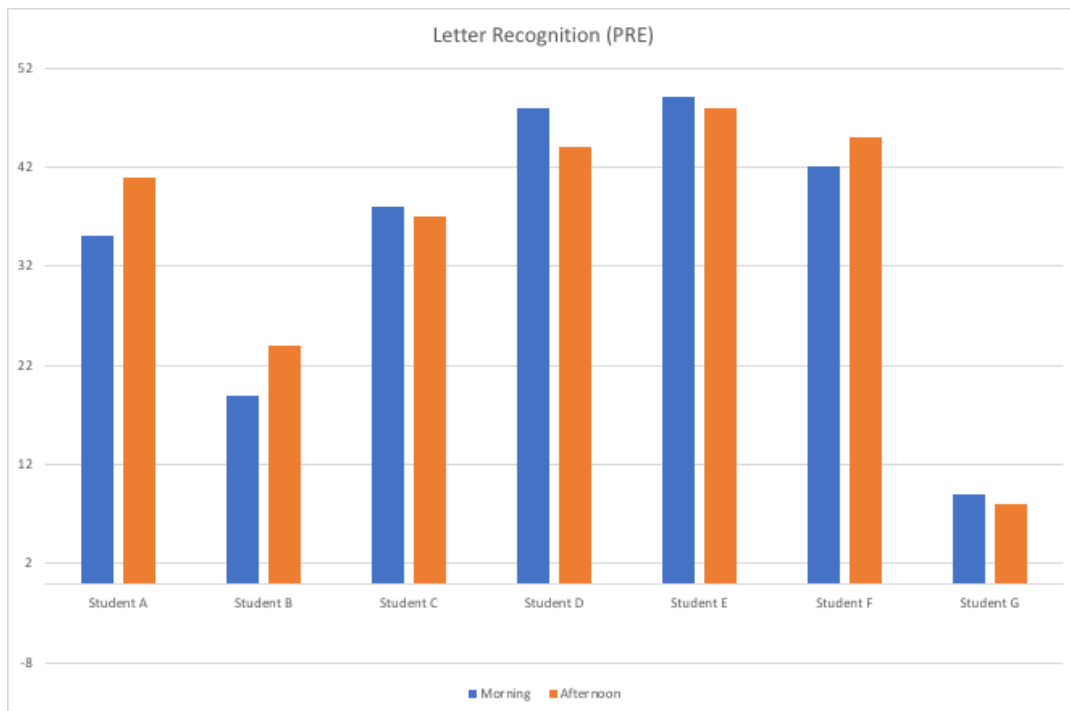
The information and data that will be collected from the subjects will remain confidential as there will be no identifying factors given in the study. Subjects and their parents will be given the purpose of the research and the requirements of the research study. Participants may withdraw from the study at any point in time.

Chapter Four

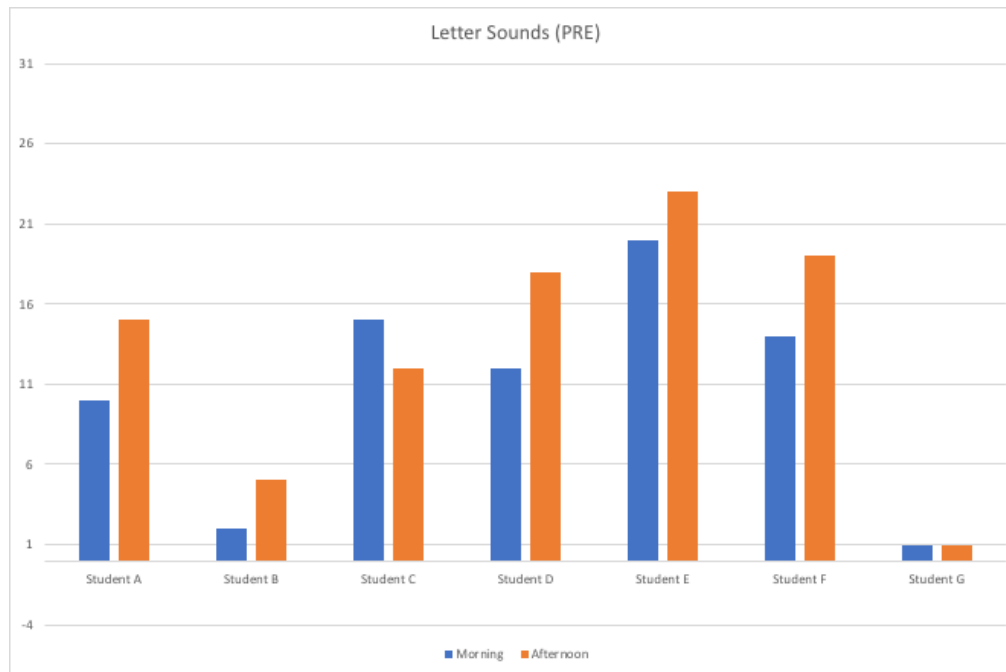
Results/Findings

What impact does the education app *Super Why* have on preschool literacy skills?

The study involved the participation of 14 preschool students, 7 morning and 7 afternoon students (labeled students A-G) to see if the app *Super Why* had positive effects on literacy skills. They were matched by similar scores for how many letters and letter sounds they knew at the start of the study. At the beginning of the study, Figure 4 shows the matches of students and how many letters they knew before the intervention phase the afternoon students participated in. The scores for letter recognition data is based out of 52 letters (26 capital letters and 26 lowercase letters). Figure 5 represents that the pre-intervention phase scores for letter sounds data and is based out of 31 sounds. Our assessment tools we use at our school include 1 letter sound for each consonant, and two for each vowel (long and short sounds). The blue bars represent the morning students and the orange bars represent the afternoon students.

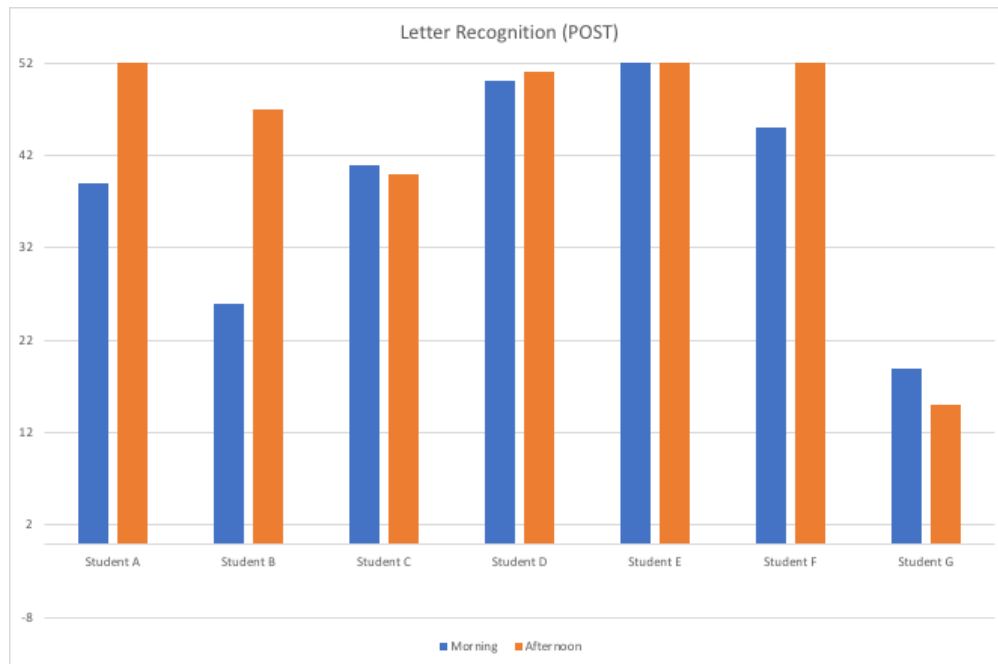


(Figure 4)

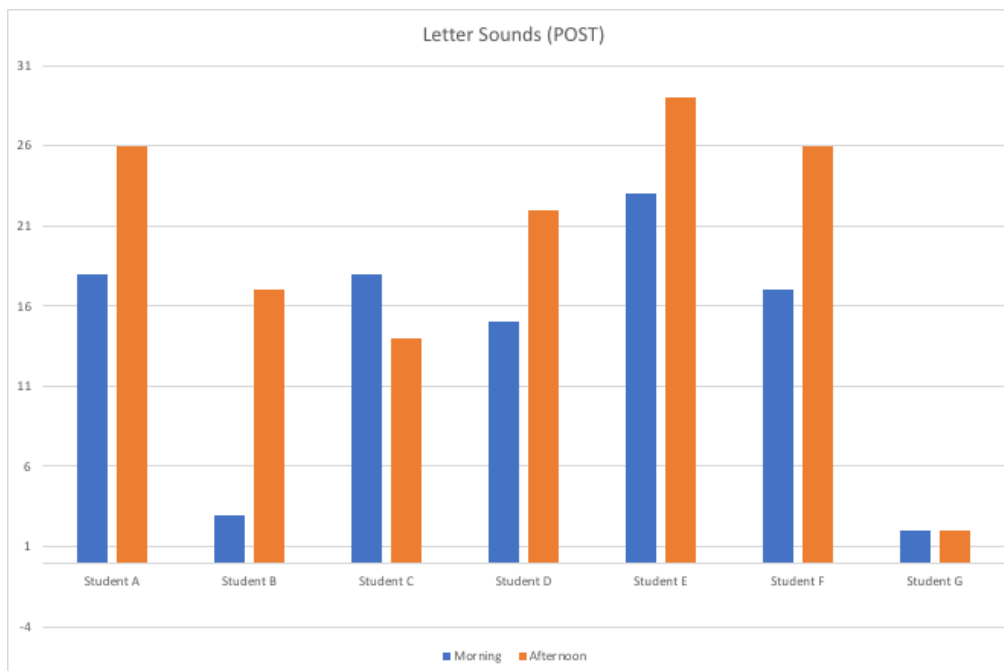


(Figure 5)

The following, Figures 6 and 7, represent the same students after the 4-week intervention phase. The blue bars represent the morning students who received normal literacy instruction, the orange bars represent afternoon students who also used the literacy app *Super Why* for 15 minutes per day for four weeks during the intervention phase. I compared the test scores with the teacher observation letter record (Figure 1) to ensure that the results closely matched the on-going data I was taking throughout the study.



(Figure 6)



(Figure 7)

Data Results

Comparable data. Looking at Figures 4 and 5, the students have similar scores for letter recognition and letter sound identification with their matched pair. However, there does seem to be slightly higher scores in Figure 5 when it comes to letter sounds in the afternoon class than the

morning. After the study, Figures 6 and 7 show that typically, those who scored higher initially before the study, still scored higher than their match at the conclusion of the study. In some cases, this was not true. Morning students D and E actually started with higher scores than their afternoon partner in letter recognition. At the conclusion of the study, their afternoon partner scored equal or even higher after using the *Super Why* app.

Growth rates. When looking at overall growth, students in the afternoon class mostly had higher growth for both letter recognition and sound identification than those in the morning class. Although this growth is not significantly higher, it is still greater growth than students in the morning that did not receive the literacy app intervention. Overall, every morning and afternoon student made growth in letter recognition and letter sound identification. Those in the afternoon mostly made slightly higher growth in scores in both areas than their morning partners.

Conclusions of Data

Possible benefits of *Super Why*. The afternoon students mostly showed higher growth than their matched peer for both letter recognition and letter sound identification. After seeing the data results, it is clear overall the afternoon students who used the supplemental literacy app could have benefitted from the intervention. Some students, such as afternoon student B, performed significantly well, which leads me to believe that technology can be a great fit for some students. I was hopeful the app would boost literacy skills so I am pleased with these promising results.

Possible implications and pitfalls. In the results of letter sound identification, the afternoon class already started out with higher scores. Having greater letter-sound knowledge could have given them an edge to perform better at the conclusion of the study as well. However, when looking at morning and afternoon students D and E, it is promising that the app could have

some benefits. Both afternoon students scored lower than their morning pair, but after using the app, they scored equal or better to their morning pair.

Some students performed very well after using the app, such as student B in the afternoon. Afternoon student B had significant growth in both letter recognition and letter sound identification. This conclusion leads me to consider the different learning styles of children. Some students might learn best with technology while others might not have seen change using apps. Some students might be at a point in their learning where this app was a perfect match for their capabilities, while not for others. Although the app ranged in skill level to meet different needs for each student, this conclusion can be tied back to Nuemann and Nuemann (2014) when choosing appropriate apps for students and that the apps chosen should be appropriate for the child. It is possible that for some students, the app became boring as they neared mastering most of their letters and sounds. It is possible they had less growth since they had already mastered most of their letter recognition and sound identification scores. For others, maybe the app seemed too challenging. For example, afternoon student G. While still showing some growth, afternoon student G did not have as high of a growth rate as afternoon student B. It is possible that scoring low to start meant more challenges along the way that could have affected their growth rate overall if the app seemed too challenging.

The use of the app was during non-structured times during our preschool day. The students were not to miss out on core instruction time, so this left open time for the app during play time. It is possible that some of the students using the app would rather have been playing with their peers. David Elkind (2016) explains that students still need time to play in the active world to explore, and that technology could take away from that. It is possible that some students did not have as much growth from using the app because they were missing out on play time

when it was their turn to use the app. For some students, they may not have minded missing out, but others might have. This could be a possible factor for why there wasn't as much growth as there potentially could have been. With our half-day preschool sessions only being 2.5 hours per day, maybe this type of app would be better suited for an all-day preschool classroom where the students have more opportunities and time to play with their friends and wouldn't mind missing out as much to use the app. This could also be an app that parents could choose to use at home instead, that way students are not missing out on social learning during play time at school.

Another factor that could have affected the results was lack of time. Due to unplanned school closures, the study was cut short. The plan was to have a full six weeks for the intervention phase, however, only four of the six weeks were completed. This could conclude that there might have been more growth if the afternoon group had more time to work on the *Super Why* app. Although the intervention group showed slightly higher growth than the morning, it is possible that growth rate could have been even larger with the remaining two weeks of the study. There is no way to tell since the study was cut short.

Final Conclusion

Overall, while the growth rate is slightly higher for afternoon students, it is not significant enough to conclude that the literacy app *Super Why* was the sole reason for this growth. However, it is promising that with enough time, with students who work well with technology, or students who have a certain range of skills, that this app could greatly help improve literacy skills for preschool students.

Chapter 5

Plans

Action Plan

Literacy apps can have positive effects on preschooler's literacy skills, however, it is important to choose the right apps for your students. After completing this study, I would love to continue using the *Super Why* app in my classroom. I think it would be beneficial to get more time for students to use it in order to see if there could be better results with a longer period of time. Students all have their own individual strengths, so I believe that for some students who learn well with technology, this is a good tool to continue using in my practice. I think I will need to continue to be careful in monitoring student use to make sure the app is not too challenging or that students are not bored using it either.

I also would suggest the exploration and use of other apps in the classroom. There is a large range of available apps out there for preschool skills, not in just literacy, but other areas like math as well. I think it would be beneficial for me to explore the different apps available to find ones that work best with certain students who could benefit from them.

Plan for Sharing

I want to share the results with the parents of my students and the possibility of benefits in case they would like to start using the app at home too. I would be sure to tell them my conclusions on how it might work well for some students, but not everyone. I would also like to share with new parents each year about the use of this app at home as a supplement for students to work on literacy skills in their home setting. In order to share with my colleagues, we have opportunities to speak at our site professional development days and I would like to set up a presentation showing the results and how the use of the app could look in a classroom setting.

The app is easy to use and is user friendly for preschoolers, so I am hopeful many of my fellow teachers will be interested in using the app in their own classrooms too. I used this study as part of my yearly goal with my administrator to focus on letter recognition and letter sound data. I will share the results with her showing that this app shows potential to have positive effects in preschool literacy skills.

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APPENDIX A

Figure 1. Teacher Observation letter record (On-going data)

Once students have mastered naming a letter at least 5 times on their own, we can circle that letter (upper or lowercase). Once students have mastered the sound of a letter at least five times on their own, we will draw a 1 in the box of that corresponding letter. If students can make more than one sound for a certain letter (such as vowels), we will write 2 in the box of the corresponding letter.

Student 1	Student 2	Student 3
A a <input type="checkbox"/>	A a <input type="checkbox"/>	A a <input type="checkbox"/>
B b <input type="checkbox"/>	B b <input type="checkbox"/>	B b <input type="checkbox"/>
C c <input type="checkbox"/>	C c <input type="checkbox"/>	C c <input type="checkbox"/>
D d <input type="checkbox"/>	D d <input type="checkbox"/>	D d <input type="checkbox"/>
E e <input type="checkbox"/>	E e <input type="checkbox"/>	E e <input type="checkbox"/>
F f <input type="checkbox"/>	F f <input type="checkbox"/>	F f <input type="checkbox"/>
G g <input type="checkbox"/>	G g <input type="checkbox"/>	G g <input type="checkbox"/>
H h <input type="checkbox"/>	H h <input type="checkbox"/>	H h <input type="checkbox"/>
I i <input type="checkbox"/>	I i <input type="checkbox"/>	I i <input type="checkbox"/>
J j <input type="checkbox"/>	J j <input type="checkbox"/>	J j <input type="checkbox"/>
K k <input type="checkbox"/>	K k <input type="checkbox"/>	K k <input type="checkbox"/>
L l <input type="checkbox"/>	L l <input type="checkbox"/>	L l <input type="checkbox"/>
M m <input type="checkbox"/>	M m <input type="checkbox"/>	M m <input type="checkbox"/>
N n <input type="checkbox"/>	N n <input type="checkbox"/>	N n <input type="checkbox"/>
O o <input type="checkbox"/>	O o <input type="checkbox"/>	O o <input type="checkbox"/>
P p <input type="checkbox"/>	P p <input type="checkbox"/>	P p <input type="checkbox"/>
Q q <input type="checkbox"/>	Q q <input type="checkbox"/>	Q q <input type="checkbox"/>
R r <input type="checkbox"/>	R r <input type="checkbox"/>	R r <input type="checkbox"/>
S s <input type="checkbox"/>	S s <input type="checkbox"/>	S s <input type="checkbox"/>
T t <input type="checkbox"/>	T t <input type="checkbox"/>	T t <input type="checkbox"/>

U u <input type="checkbox"/>	U u <input type="checkbox"/>	U u <input type="checkbox"/>
V v <input type="checkbox"/>	V v <input type="checkbox"/>	V v <input type="checkbox"/>
W w <input type="checkbox"/>	W w <input type="checkbox"/>	W w <input type="checkbox"/>
X x <input type="checkbox"/>	X x <input type="checkbox"/>	X x <input type="checkbox"/>
Y y <input type="checkbox"/>	Y y <input type="checkbox"/>	Y y <input type="checkbox"/>
Z z <input type="checkbox"/>	Z z <input type="checkbox"/>	Z z <input type="checkbox"/>

APPENDIX B

Figure 2. School Readiness Observation Form. (Initial and final data)

To be completed as a pre-test before the intervention phase for all students, and to be completed after the intervention phase for all students as a post-test.

School Readiness Observation		
Child's Name (First/Last)	Date of Birth:	Date of Observations:
Teacher's Name:	Class/Site:	Entering Kindergarten: Fall of (yr.)
Letter Recognition and Letter Sounds:		
UPPER: Circle letters recognized. X out letter for sounds. Upper Recognized: /26 Letter Sounds: /26		
F	X	A C T B L R I
S	P	G N W O H E D
M	K	Z J Y Q U V
LOWER: Circle letters recognized. Lower recognized: /26		
k	e	h f w n g p s
i	o	r x a l c b t
v	u	q y j z d m

(Figure 2.)

APPENDIX C

Figure 3. iPad Use Record Sheet

Each child using the intervention will have an iPad Use Record Sheet. Their name will be filled out on top, followed by the date, the amount of time they used the iPad app *Super Why*, and teacher initials indicating the child used the app correctly with fidelity. Records will be kept weekly (five school days) for four weeks total.

Name:		
Date	Time	Initial

APPENDIX D

Figure 4. Pre-Intervention Letter Recognition Data

This data was taken on students participating in the study prior to the intervention phase on February 13, 2020. These are test scores for letter recognition out of 52 letters.

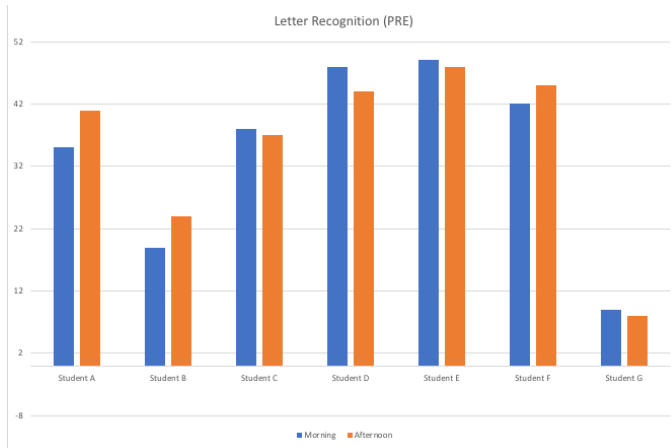


Figure 5. Pre-Intervention Letter Sound Data

This data was taken on students participating in the study prior to the intervention phase on February 13, 2020. These are test scores out of 31 letter sounds.

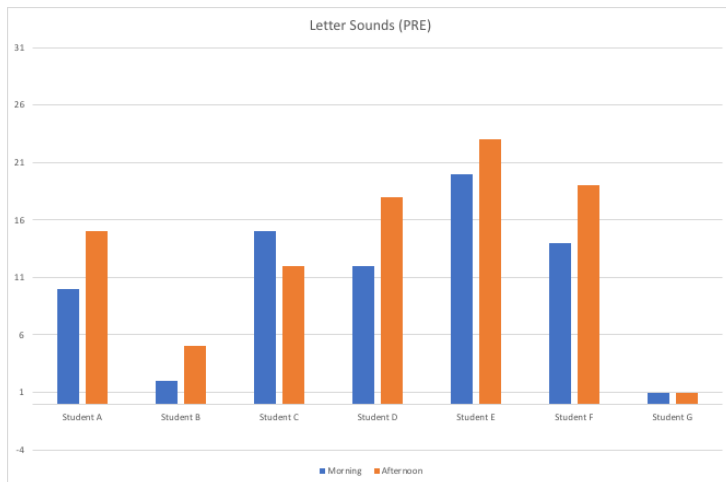


Figure 6. Post-Intervention Letter Recognition Data

This data was taken on students participating in the study at the conclusion of the study on March 16, 2020. These are test scores for letter recognition out of 52 letters.

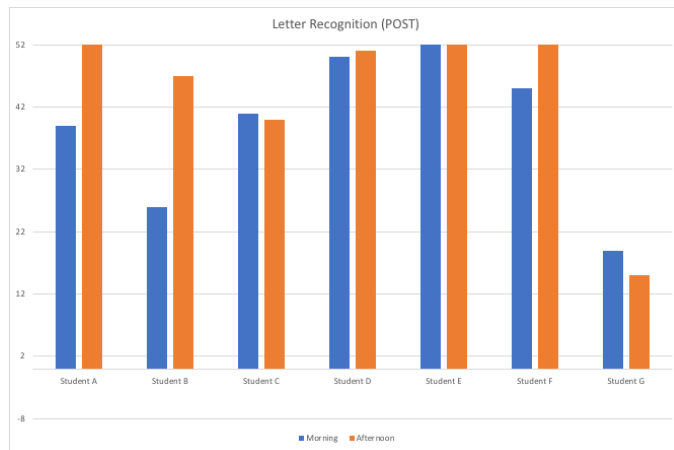


Figure 7. Post-Intervention Letter Sound Data

This data was taken on students participating in the study at the conclusion of the study on March 16, 2020. These are test scores out of 31 letter sounds.

